antibody test slides by two technologists, Although influenza virus was not isolated from any of the laboratory reagents or supplies cultured, it is possible that a reagent, contaminated with influenza virus, was used up by mid-November, when the last patient's respiratory specimen was cultured. In fact, a supply of supplemented Dulbecco's MEM was prepared on October 26 and was used at least until November 11. The last day of use of this supply is not known.

Influenza virus contamination of laboratory specimens was first reported in 1944 by Andrewes, *et al.*[11] One episode of contamination occurred in a laboratory where no work had been done with the implicated virus during the preceding 17 days.[12] In 1980, Bean, *et al,* described an unusual influenza virus, influenza A/Rio de Janeiro/7/78(H3N2), which was initially thought to be the cause of an outbreak in Brazil in 1978, but was later thought to be possibly due to laboratory contamination of clinical specimens.[13]

When evidence suggested laboratory contamination, Laboratory A began using separate areas for working with clinical specimens and for research and other non-clinical work, and began using only recently prepared reagents. All institutions handling both clinical specimens and reference strains or laboratory isolates should follow strict guidelines to prevent contamination of clinical specimens.[2]

Whenever a cluster of an unusual or unexpected virus isolate is reported, the possibility of laboratory contamination should be considered. Special efforts to support the validity of such a cluster may be warranted, including examination of the history surrounding the virus isolation, epidemiologic investigations, serologic corroboration in persons with suspected infections, virus reisolation, and antigenic and molecular analysis of the virus.

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Consumer Demand for Patient-Oriented Pharmacy Services

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Abstract: The purpose of this study was to investigate the extent of consumer demand for patient-oriented pharmacy services. Data, collected via a self-administered questionnaire distributed to 300 households, were analyzed using Kruskal's program for additive conjoint analysis. The results indicate substantial consumer demand for making advisory services available on request, moderate demand for provision of patient medication records, and little demand for voluntary provision of advisory services. (*Am J Public Health* 1984; 74:609–611.)

Introduction

The provision of professional pharmacy services is a potentially important, but generally neglected, part of the community pharmacist's duties. Professional services include counseling patients in proper use of prescription and over-the-counter (OTC) drugs, warning them about side effects, and monitoring drug therapy through use of patient medication records (PMRs). Providing these services may be important because of their potential to improve patient compliance and prevent adverse drug reactions.[1–4]

It has been argued that the failure of pharmacists to provide such services routinely is due to lack of consumer demand.[5,6] The purpose of the present study was to assess consumer demand for professional pharmacy services.

Methods

Data for the study were collected via a mail questionnaire survey of 300 households selected from the Raleigh, NC city directory by a system of random numbers. The survey procedure included an initial mailing of the questionnaires and up to two follow-up mailings to nonrespondents.

The survey instrument asked the primary drug purchaser in each household to indicate the relative importance of four pharmacy attributes in determining where he/she purchased prescription drugs. The four attributes were: advisory services,* PMRs,** prescription prices, and pharmacist

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*Advisory services were defined as "advice or instructions which the pharmacist may give you about medicines and how to use them."

**PMRs were defined as "a record of all the medicines you take and of your drug allergies. The pharmacist may keep this record to make sure you are not given drugs to which you are allergic, or drugs which may have a harmful effect with other drugs you are taking."

TABLE 1—Demographic Description of Respondent Sample[a]

Age (years)	46 (±16)
Prescription Drug Expenditures for past 6 months ($)	94 (±113)
Sex (% female)	74
Insurance (% having coverage for prescription drugs)	21
Income (% having annual income of)	
$ 0- 9,999	15
10,000–19,999	30
20,000–29,999	24
≥30,000	31
Education (% whose highest educational level is:)	
Grade school	7
High school or some post-high school	45
College graduate	48

[a]The figures reported are weighted means and weighted percentages.

TABLE 2—Pharmacy Attribute Importance Weights

Patronage Motive	Mean (S.D.)	Confidence Interval
Very Friendly Pharmacists	1.15 (±1.21)	$0.93 < p < 1.37$
Advisory Services Provided Voluntarily	0.14 (±1.09)	$-0.04 < p < 0.32$
Advisory Services Available if Requested	2.15 (±1.29)	$1.93 < p < 2.37$
$1.00 Difference in Average Prescription Price	0.83 (±1.21)	$0.63 < p < 1.03$
Patient Medication Records Provided	1.19 (±1.21)	$0.99 < p < 1.39$

friendliness. Respondents were presented with a list of eight pharmacies, each differing from the other in the amount of at least one of these attributes, and asked to rank order the eight pharmacies from "most" to "least" preferred.

These data were analyzed using Kruskal's program for additive conjoint analysis, a type of monotonic interative analysis of variance.[7] For each respondent, five attribute importance scores were estimated:

1. The importance of having pharmacists who are very friendly rather than pharmacists who are neither friendly nor unfriendly;
2. The importance of having advisory services volunteered rather than merely available upon request;
3. The importance of having advisory services if requested rather than having no advisory services available;
4. The importance of a $1.00 difference in average prescription price; and
5. The importance of having PMRs maintained.

Respondents were also asked whether the pharmacy they usually patronized provided PMRs and how frequently pharmacists provided them with several advisory services.

Results

The survey yielded a response rate of 59 per cent. A check for nonresponse bias indicated large differences in response rate among the zip code districts to which questionnaires were mailed. To adjust for these differences, a weighting factor—calculated as 1/response rate in the respondent's zip code district—was used in the analyses.[8]

A comparison of the weighted age and income distributions for the sample with the age and income of the Raleigh area indicated that only consumers in the 18-24 year old age range were seriously underrepresented in the sample. Because consumers in this age range tend not to be heavy users of prescription drugs, this does not represent a serious limitation. A description of the respondent sample is shown in Table 1.

The data in Table 2 present mean and standard deviations for the attribute importance weights. These data suggest that respondents were extremely concerned that advisory services be made available if requested in the pharmacy where they purchased prescription drugs. They did not, however, attribute additional value to the voluntary provision of these services. Respondents also indicated that provision of PMRs, having very friendly pharmacists, and a $1.00 difference in average prescription price were of about the same value to them.

As shown in Table 3, a majority of respondents reported that their pharmacists are available most of the time to answer their drug-related questions. However, about half reported that their pharmacist usually does not give them verbal dosage directions, and a majority indicated that their pharmacist does not instruct them about proper storage or possible side effects of their drugs.

While half of the sample (48.1 per cent) did not know whether their pharmacy maintained PMRs, about one-third (29.8 per cent) reported that PMRs were maintained by their pharmacist.

Discussion

The results suggest that there is a great deal of difference in the extent of consumer demand for each of the services studied. The provision of PMRs was as important to consumers as a $1.00 price difference or having very friendly pharmacists. Given that consumers value lower prices and friendly pharmacists,[9] this suggests that they also value

TABLE 3—Frequency of Provision of Advisory Services

Service	No. (%)[a] of Respondents Who Received Service						
	Never	Infrequently	Half the Time	Most of the Time	Always	Do Not Know	Total
Pharmacist explains dosage directions	33 (25.8)	27 (19.2)	14 (10.8)	33 (23.0)	28 (20.0)	3 (1.2)	138 (100)
Pharmacist gives side effect warnings	57 (44.6)	25 (17.4)	9 (7.0)	24 (15.9)	18 (12.8)	3 (2.3)	136 (100)
Pharmacist explains proper method of storage	71 (52.6)	23 (17.8)	8 (6.5)	12 (9.6)	19 (11.2)	4 (2.3)	137 (100)
Pharmacist is available to answer questions about OTC drugs	0 (0.0)	5 (4.6)	14 (10.8)	40 (27.7)	66 (46.3)	14 (10.6)	139 (100)
Pharmacist is available to answer questions about prescription drugs	1 (0.8)	3 (3.1)	11 (8.8)	44 (31.3)	66 (44.7)	15 (11.3)	140 (100)

[a]The figures reported refer to the actual, unweighted number of respondents and the weighted per cent of respondents in each category.

provision of PMRs. Hence, there appears to be at least moderate consumer demand for this service. Further, there is unmet demand—only 30 per cent of respondents reported receiving PMR service.

The case for advisory services is somewhat different. Consumers appear to consider the availability of advisory services on request to be very important, but pharmacies are meeting this demand. Consumers do not, however, appear to attribute additional value to voluntary provision of such services.

These results suggest that lack of consumer demand is an important reason why pharmacists do not volunteer advisory services, but that other non-economic factors such as pharmacists' perceptions and time constraints may also be more important in explaining why they do not provide PMRs.

Several limitations should be noted. First, because the study was performed in a limited geographical area the results may not be applicable to other areas or populations. Second, the study measured preferences and not actual behavior, hence it may not accurately reflect consumers' actual pharmacy patronage behavior. Finally, the study was conducted in a state which required neither PMRs nor pharmacists consultation. It is possible that consumers in states which require these services—because they are more familiar with them—have different attitudes toward service provision.

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Predicting Changes in Perceived Health Status

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Abstract: Panel data from the Los Angeles Health Survey (N = 903) were used to examine variables associated with changes in perceived health status over a one-year period. Our findings replicate previous research showing that perceived health status is associated with variations in chronic illness, disability, and the utilization of health services. However, we found that neither positive nor negative changes in perceived health status were related to any indicator of health beliefs or practices or physical health status. The data suggest that single item measures of perceived health status may reflect the individual's sense of long-standing chronic illness. (*Am J Public Health* 1984; 74:611–614.)

Introduction

Self-report indices of health status, or perceived health, have been widely used in health surveys. For example, between 1958 and 1976 no fewer than 38 studies which utilized these indices appeared in the empirical literature.[1] More often than not, these indices have consisted of a single self-report item, such as "How would you rate your health overall (poor, fair, good, excellent)?" The popularity of these indices is easy to understand. They are simple to administer and are low in cost to process; and, to the extent that self-reports of health status are used in place of physician or other health professional's ratings, they are cost effective. Furthermore, as a subjective response, they could reflect the individual's access to information about the nervous, endocrine, and immunologic systems that is not tapped by other types of measurement,[2] thus providing information relevant to the psychosocial component of health.

Findings from the longitudinal Midtown Manhattan Study[3] showed that, among those variables measured, perceived health was the strongest predictor of mortality, aside from sex and age. These findings regarding the influence of precise nature of perceived health status influence are inconclusive, however, because the investigators were unable to control for objective health status. To address this shortcoming, two recent reports of longitudinal data have appeared, both of which include statistical controls for objective health status. Data from the Manitoba Longitudinal Study on Aging[4] revealed that when controlling for objective health status, age, sex, life satisfaction, income, and residence, the risk of mortality was almost three times greater for those individuals who earlier had reported their health status as poor compared to those who rate their health as excellent. Even more important is the finding that the risk associated with poor self-rated health was actually higher than that associated with poor prior objective health status, as assessed by physician and self-reported conditions. Similarly, Kaplan and Camacho[2] report a two-fold mortality risk over nine years for poor compared to excellent self-rated health among the participants in the Alameda County Human Population Laboratory sample. Statistical controls were introduced to partial out the effects of age, sex, physical health status, health practices, social network participation, income, education, health relative to age peers, and mental

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